BOTANICAL SOCIETY OF EDINBURGH.

May 8, 1856.—Colonel Madden, President, in the Chair.

The following papers were read:—

1. "On the Sexuality of the Algæ," by Dr. Ferdinand Cohn, of Breslau.

After adverting to the various recent discoveries in Cryptogamic reproduction, particularly those of Thuret and Pringsheim, the author gave an account of the phænomena observed by him in *Sphæroplea annulina*. He showed that the cells of one part of the filament became male, and exhibited antheridia filled with spermatozoa, while those of the other part became female, being transformed into sporangia, developing many spores. He then described minutely the mode in which the spermatozoa came into contact with the female cells and fertilized the spores. He also gave an account of the mode of fecundation in the genus *Œdogonium*.

"Having observed," the author remarks, "in the lower plants the necessity of the material and immediate contact and union of spermatozoa and eggs or spores; the want of a peculiar membrane around the latter before impregnation; the formation of this wall and the multiplication of the developed cell as the immediate consequence of fecundation, we may conclude that the same course of development may also be followed in the reproduction of other organisms,—a conclusion which is entirely confirmed by the most recent observations on the fecundation of animals."

2. "On the Preparation of Sugar and Arrack from Palms in Ceylon," by Alexander Smith, M.D.

Three Palms yield sugar in Ceylon: *Cocos nucifera, Borassus flabelliformis,* and *Caryota urens*. From each of these the juice of the flowering-stalk is collected, and from it sugar is regularly prepared; but it is from the *Borassus* that almost all the palm sugar is obtained. It is from the sugar of the *Cocos* that arrack is made in Ceylon.

3. "On the occurrence of Scalariform Tissue in the Devonian Strata of the South of Ireland," by Robert Harkness, F.G.S., Professor of Geology, Queen's College, Cork.

The author, after noticing the occurrence of *Cyclopteris hibernica* in the neighbourhood of Cork, remarked that in some of the higher beds of the Devonians of the South of Ireland there had been found great quantities of drifted vegetable matter in the form of more or less perfect stems of trees, exhibiting in their interior a fibrous charcoal-like substance, which when examined by the microscope presented evident scalariform tissue, showing that the plants belonged to the Fern alliance.

4. "Notice of some additions to the Cryptogamic Flora of Edinburgh," by Mr. W. Nichol.

The author remarked that the presence of such plants as *Leskia subrufa, Trichostomum flexicaule, Anœctangium compactum, Encalypta ciliata, Tortula tortuosa, Bryum Zierii,* and *Blindia acuta,*

at Habbies How, indicates an approach to an alpine flora. Habbies How is a narrow chasm running nearly east and west, bounded on each side by precipitous rocks, which are seldom exposed to the rays of the sun. It lies at the base of the northern slope of the highest of the Pentlands (here attaining an altitude of about 1800 feet), and it is on the rocks facing the north that the plants occur.

Professor Balfour read a letter from Mr. Macmillan, in which he stated that he had received a number of Lichens gathered on the Cumbraes, among which were several very rare species, for which no locality had previously been found in Scotland, they being eminently southern species; such as *Parmelia tiliacea* and *corrugata*, and *Opegrapha Lyellii* and *dendritica*.

Mr. Macmillan remarks:—"I found in a wood immediately above Inver, near Dunkeld, an immense number of juniper bushes, the stems and branches of which were profusely covered with magnificent specimens of the *Podisoma juniperi-communis*, a very rare Hypodermous fungus, previously found only, as far as I am aware, in one or two stations in England. Last year, I observed beside the monument in the grounds of Taymouth Castle, a very old juniper bush completely covered with it. In a fresh state, and particularly during damp or rainy weather, it bears considerable resemblance to some species of *Clavaria*; growing in the form of a bundle of thick gelatinous stems of an orange colour, and tapering at one extremity—aggregated together on the part of the branch infested, and completely enveloping it—and thus giving it an appearance not unlike a pine-apple when seen from a little distance. In an old state, and in hot weather, however, it dries up and becomes hard and shrivelled."

June 12, 1856.—Prof. Balfour, V.P., in the Chair.

The following papers were read:—

1. "Elucidation of some Plants mentioned in Dr. Francis Hamilton's Account of the Kingdom of Nepal," by Lieut.-Colonel Madden.

An attempt to determine several of the doubtful species.

2. "On the Duration of the Life of Plants," by Prof. Fleming.

3. "Inquiry into the signs of current Electricity in Plants," by H. F. Baxter, Esq.

After alluding to the researches of Becquerel, Donné, Wartmann, and Zantedeschi, the author proceeded to detail experiments made on plants by means of the electrodes of a galvanometer. He examined the electric currents in the leaves, roots, flowers, fruits, and tubers, and the following are the conclusions drawn:—

1st. That when the electrodes of a galvanometer are brought into contact, one with the surface of the leaf, and the other with the sap flowing from the same leaf, an effect occurs upon the needle indicating the surface and the sap to be in opposite electric states. These effects cannot be referred entirely to ordinary electro-chemical actions, but may be referred, in part, to the organic changes which take place in the leaf during vegetation.

2nd. When the electrodes are brought into contact, one with the external surface of the spongioles of a plant, and the other with the sap ascending from the root, the sap and the external surface are in opposite electric states. The effects which are here observed with the galvanometer may, in the majority of instances, be due to ordinary electro-chemical actions; but in some instances the effect cannot be referred to these actions, but may be referred to the organic changes which occur in the roots during vegetation.

3rd. That with the petals of flowers slight currents were obtained; and,

4th. In fruits and tubers powerful currents may be occasionally obtained; but these effects are evidently secondary results, due to the reaction of the different vegetable juices upon each other.

4. "Notice of some Additions to the Hepaticæ of the neighbourhood of Edinburgh," by John Lowe, Esq.

5. "Record of Localities for Rare Plants," by Prof. Balfour.

6. "Continuation of Account of some of the Contents of the Museum at the Botanic Garden," by Prof. Balfour.

7. "List of the Fibrous Plants of India," communicated by Prof. Balfour.

MISCELLANEOUS.

On the probable Origin of the Organized Beings now living in the Azores, Madeira, and the Canaries. By M. Oswald Heer. In a letter to M. A. DeCandolle.

In your Geography of Plants you have adopted the opinion of Edward Forbes, that in the miocene period the European continent extended to the Azores and Canaries, and supported it by fresh proofs*. In fact, the predominant European character of these islands, which occurs in their insects as well as in their flora, proves that they were anciently joined to the continent. Nevertheless we must not forget that, as compared with Europe, these islands are very different from those of the Mediterranean. They are distinguished in the first place by a much greater number of peculiar species, which constitute a-third or a fifth of the plants; and in the second by some American types, which make their appearance in all these islands. These are not only certain American species which might have reached them accidentally by the agency of the winds and currents, or of man, but American genera which are represented by peculiar species. I will instance the genera *Clethra*, *Bystropogon*, and *Cedronella*, as also the unique pine of the Canaries (*Pinus canariensis*, Sm.), which belongs to the American forms with acicular ternate leaves. The relations of the Laurels is very remarkable in this respect; they form a great part of the forests of Madeira and the Canaries, dividing into four species and playing an important part. Two species (*Oreo-*

* DeCandolle, Géographie Botanique raisonnée, p. 1310.